IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

PENDING CLAIMS

1. (ORIGINAL) A difference updating method comprising:

a difference data reception step, with a difference data reception unit, receiving difference data of all the segments which is generated for each segment by dividing a new one of two old and new files into a plurality of segments of the same size and searching for a data row matching a data row in each segment within the range from the position which is one segment before the starting position of a target segment of the old file to the endmost of the old file and storing the received difference data into a nonvolatile memory;

a restoration processing step, with a restoration processing unit, storing the restoration process segment number (X) indicative of a current process segment into the nonvolatile memory, thereafter restoring segment data from one segment of the difference data and storing the restored segment data into the nonvolatile memory; and

an overwrite processing step, with an overwrite processing unit, storing the overwrite processing segment number (X-1) indicative of an immediately preceding process segment into the nonvolatile memory, thereafter reading from the nonvolatile memory the restored data which has been restored on the immediately preceding segment and overwriting the read restored data onto data to be rewritten in a nonvolatile memory.

2. (ORIGINAL) The difference updating method according to claim 1, wherein the difference data reception step includes receiving the difference data for each segment which is generated by searching for a data row matching a data row in each segment within the range from the starting position of a target segment of the old file to the endmost of the old file.

3. (ORIGINAL) The difference updating method according to claim 1, further comprising:

a decision step, with a decision unit, deciding whether the power supply is interrupted during the restoration process of the segment data or the power supply is interrupted

during the overwriting process of the segment data, after the power supply is recovered in the case of power interruption;

a restoration resume step, with a restoration resume unit, resuming the restoration process from the head of the segment of the restoration process segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the restoration process of the segment data; and

an overwriting resume step, with an overwriting resume unit, resuming the overwriting process from the head of the overwrite processing segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the overwriting process of the segment data.

4. (ORIGINAL) The difference updating method according to claim 3, wherein the decision step includes calculating a difference between the restoration process segment number and the overwrite processing segment number after the power supply is recovered in the case of the power interruption, deciding that the power supply was interrupted during the restoration process if the difference is 1, and deciding that the power supply was interrupted during the overwriting process if the difference is 2.

5. (ORIGINAL) The difference updating method according to claim 1, wherein the restoration processing step includes deciding whether the content of the restored segment data which is restored from one segment of the difference data and the content of the corresponding segment data of the data to be written are identical or not, and, if these are identical, describing into the nonvolatile memory that the old and the new are identical, instead of the restored segment data; and wherein

the overwrite processing step includes skipping the overwriting of the restored segment data if it is described in the nonvolatile memory that the old and the new are identical.

6. (ORIGINAL) The difference updating method according to claim 1, wherein the restoration processing step further includes equally dividing the restored segment data which is restored from one segment of the difference data into n pieces of restored block data, deciding whether the restored block data and the rewrite data are identical or not for each block, and, if these are identical, describing into the nonvolatile memory that the old and the new are identical, instead of the restored block data; and wherein

the overwrite processing step includes skipping the overwriting of the restored

block data if it is described in the nonvolatile memory that the old and the new are identical.

7. (ORIGINAL) A difference updating method comprising:

a difference data reception step, with a difference data reception unit, generating difference data for each segment by dividing a new one of two old and new files into a plurality of segments of the same size and searching for a data row matching a data row in each segment within the range from the position which is one segment before the starting position of a target segment of the old file to the endmost of the old file, as well as equally dividing one segment of the old and new data into n blocks, deciding whether the block data of new file and the block data of old file are identical or not on a block-to-block basis, and, if these are identical, describing that the old and the new are identical into the difference data, instead of the difference block data, receiving the difference data of all the segments which has the description and storing the received difference data into a nonvolatile memory;

a restoration processing step, with a restoration processing unit, storing the restoration process segment number (X) indicative of a current process segment into the nonvolatile memory, thereafter restoring the block data which is divided into n pieces per one segment of the difference data and storing the restored block data into the nonvolatile memory; and

an overwrite processing step, with an overwrite processing unit, storing the overwrite processing segment number (X-1) indicative of an immediately preceding process segment into the nonvolatile memory, thereafter reading from the nonvolatile memory the restored block data which is divided into n pieces per restored data which is restored on the immediately preceding segment and overwriting the read restored block data onto the data to be written in the nonvolatile memory.

8. (ORIGINAL) The difference updating method according to claim 7, further comprising:

a decision step, with a decision unit, deciding whether the power supply is interrupted during the restoration process of the segment data or the power supply is interrupted during the overwriting process of the segment data, after the power supply is recovered in the case of power interruption;

a restoration resume step, with a restoration resume unit, resuming the restoration process from the head of the segment of the restoration process segment number read from the nonvolatile memory after the power recovery in the case where the power supply

has been interrupted during the restoration process of the segment data; and

an overwriting resume step, with an overwriting resume unit, resuming the overwriting process from the head of the overwrite processing segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the overwriting process of the segment data.

9. (ORIGINAL) The difference updating method according to claim 7, wherein

the restoration processing step includes skipping the restoration process based on the difference block data and describing in the nonvolatile memory that the old and the new are identical, if it is described in the difference block data that the old and the new are identical, and wherein

the overwrite processing step includes skipping the overwriting of the restored block data, if it is described in the nonvolatile memory that the old and the new are identical.

10. (ORIGINAL) A program allowing a computer to execute:

a difference data reception step receiving difference data of all the segments which is generated for each segment by dividing a new one of two old and new files into a plurality of segments of the same size and searching for a data row matching a data row in each segment within the range from the position which is one segment before the starting position of a target segment of the old file to the endmost of the old file and storing the received difference data into a nonvolatile memory;

a restoration processing step storing the restoration process segment number (X) indicative of a current process segment into the nonvolatile memory, thereafter restoring segment data from one segment of the difference data and storing the restored segment data into the nonvolatile memory; and

an overwrite processing step storing the overwrite processing segment number (X-1) indicative of an immediately preceding process segment into the nonvolatile memory, thereafter reading from the nonvolatile memory the restored data which has been restored on the immediately preceding segment and overwriting the read restored data onto data to be rewritten in the nonvolatile memory.

11. (ORIGINAL) The program according to claim 10, wherein the difference data reception step includes receiving the difference data for each segment which is generated by searching for a data row matching a data row in each segment within the range from the starting

position of a target segment of the old file to the endmost of the old file.

12. (ORIGINAL) The program according to claim 10, further comprising:

a decision step deciding whether the power supply is interrupted during the restoration process of the segment data or the power supply is interrupted during the overwriting process of the segment data, after the power supply is recovered in the case of power interruption;

a restoration resume step resuming the restoration process from the head of the segment of the restoration process segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the restoration process of the segment data; and

an overwriting resume step resuming the overwriting process from the head of the overwrite processing segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the overwriting process of the segment data.

13. (ORIGINAL) The program according to claim 12, wherein the decision step includes calculating a difference between the restoration process segment number and the overwrite processing segment number after the power supply is recovered in the case of the power interruption, deciding that the power supply was interrupted during the restoration process if the difference is 1, and deciding that the power supply was interrupted during the overwriting process if the difference is 2.

14. (ORIGINAL) The program according to claim 10, wherein the restoration processing step includes deciding whether the content of the restored segment data which is restored from one segment of the difference data and the content of the corresponding segment data of the data to be written are identical or not, and, if these are identical, describing into the nonvolatile memory that the old and the new are identical, instead of the restored segment data; and wherein

the overwrite processing step includes skipping the overwriting of the restored segment data if it is described in the nonvolatile memory that the old and the new are identical.

15. (ORIGINAL) The program according to claim 10, wherein the restoration processing step further includes equally dividing the restored segment data which is restored

from one segment of the difference data into n pieces of restored block data, deciding whether the restored block data and the rewrite data are identical or not for each block, and, if these are identical, describing into the nonvolatile memory that the old and the new are identical, instead of the restored block data; and wherein

the overwrite processing step includes skipping the overwriting of the restored block data if it is described in the nonvolatile memory that the old and the new are identical.

16. (ORIGINAL) A program allowing a computer to execute:

a difference data reception step generating difference data for each segment by dividing a new one of two old and new files into a plurality of segments of the same size and searching for a data row matching a data row in each segment within the range from the position which is one segment before the starting position of a target segment of the old file to the endmost of the old file, as well as equally dividing one segment of the old and new data into n blocks, deciding whether the block data of new file and the block data of old file are identical or not on a block-to-block basis, and, if these are identical, describing that the old and the new are identical into the difference data, instead of the difference block data, receiving the difference data of all the segments which has the description and storing the received difference data into a nonvolatile memory;

a restoration processing step storing the restoration process segment number (X) indicative of a current process segment into the nonvolatile memory, thereafter restoring the block data which is divided into n pieces per one segment of the difference data and storing the restored block data into the nonvolatile memory; and

an overwrite processing step storing the overwrite processing segment number (X-1) indicative of an immediately preceding process segment into the nonvolatile memory, thereafter reading from the nonvolatile memory the restored block data which is divided into n pieces per restored data which is restored on the immediately preceding segment and overwriting the read restored block data onto the data to be written in the nonvolatile memory.

17. (ORIGINAL) The program according to claim 16, wherein the difference data reception step includes receiving the difference data for each segment which is generated by searching for a data row matching a data row in each segment within the range from the starting position of a target segment of the old file to the endmost of the old file.

18. (ORIGINAL) The program according to claim 16, further comprising:

a decision step deciding whether the power supply is interrupted during the restoration process of the segment data or the power supply is interrupted during the overwriting process of the segment data, after the power supply is recovered in the case of power interruption;

a restoration resume step resuming the restoration process from the head of the segment of the restoration process segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the restoration process of the segment data; and

an overwriting resume step resuming the overwriting process from the head of the overwrite processing segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the overwriting process of the segment data.

19. (ORIGINAL) The program according to claim 18, wherein the decision step includes calculating a difference between the restoration process segment number and the overwrite processing segment number after the power supply is recovered in the case of the power interruption, deciding that the power supply was interrupted during the restoration process if the difference is 1, and deciding that the power supply was interrupted during the overwriting process if the difference is 2.

20. (ORIGINAL) The program according to claim 16, wherein

the restoration resume step includes skipping the restoration process based on the difference block data and describing in the nonvolatile memory that the old and the new are identical, if it is described in the difference block data that the old and the new are identical, and wherein

the overwrite processing step includes skipping the overwriting of the restored block data, if it is described in the nonvolatile memory that the old and the new are identical.

21. (ORIGINAL) A difference updating apparatus comprising:

a difference data reception unit for receiving difference data of all the segments which is generated for each segment by dividing a new one of two old and new files into a plurality of segments of the same size and searching for a data row matching a data row in each segment within the range from the position which is one segment before the starting position of a target segment of the old file to the endmost of the old file and storing the received difference

data into a nonvolatile memory;

a restoration processing unit for storing the restoration process segment number (X) indicative of a current process segment into the nonvolatile memory, thereafter restoring segment data from one segment of the difference data and storing the restored segment data into the nonvolatile memory;

an overwrite processing unit for storing the overwrite processing segment number (X-1) indicative of an immediately preceding process segment into the nonvolatile memory, thereafter reading from the nonvolatile memory the restored data which has been restored on the immediately preceding segment and overwriting the read restored data onto data to be rewritten in the nonvolatile memory;

a decision unit for deciding whether the power supply is interrupted during the restoration process of the segment data or the power supply is interrupted during the overwriting process of the segment data, after the power supply is recovered in the case of power interruption;

a restoration resume unit for resuming the restoration process from the head of the segment of the restoration process segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the restoration process of the segment data; and

an overwriting resume unit for resuming the overwriting process from the head of the overwrite processing segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the overwriting process of the segment data.

22. (ORIGINAL) A difference updating apparatus comprising:

a difference data reception unit for generating difference data for each segment by dividing a new one of two old and new files into a plurality of segments of the same size and searching for a data row matching a data row in each segment within the range from the position which is one segment before the starting position of a target segment of the old file to the endmost of the old file, as well as equally dividing one segment of the old and new data into n blocks, deciding whether the block data of new file and the block data of old file are identical or not on a block-to-block basis, and, if these are identical, describing that the old and the new are identical into the difference data, instead of the difference block data, receiving the difference data of all the segments which has the description and storing the received difference data into a nonvolatile memory;

a restoration processing unit for storing the restoration process segment number

(X) indicative of a current process segment into the nonvolatile memory, thereafter restoring the block data which is divided into n pieces per one segment of the difference data and storing the restored block data into the nonvolatile memory;

an overwrite processing unit for storing the overwrite processing segment number (X-1) indicative of an immediately preceding process segment into the nonvolatile memory, thereafter reading from the nonvolatile memory the restored block data which is divided into n pieces per restored data which is restored on the immediately preceding segment and overwriting the read restored block data onto the data to be written in the nonvolatile memory;

a decision unit for deciding whether the power supply is interrupted during the restoration process of the segment data or the power supply is interrupted during the overwriting process of the segment data, after the power supply is recovered in the case of power interruption;

a restoration resume unit for resuming the restoration process from the head of the segment of the restoration process segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the restoration process of the segment data; and

an overwriting resume unit for resuming the overwriting process from the head of the overwrite processing segment number read from the nonvolatile memory after the power recovery in the case where the power supply has been interrupted during the overwriting process of the segment data.